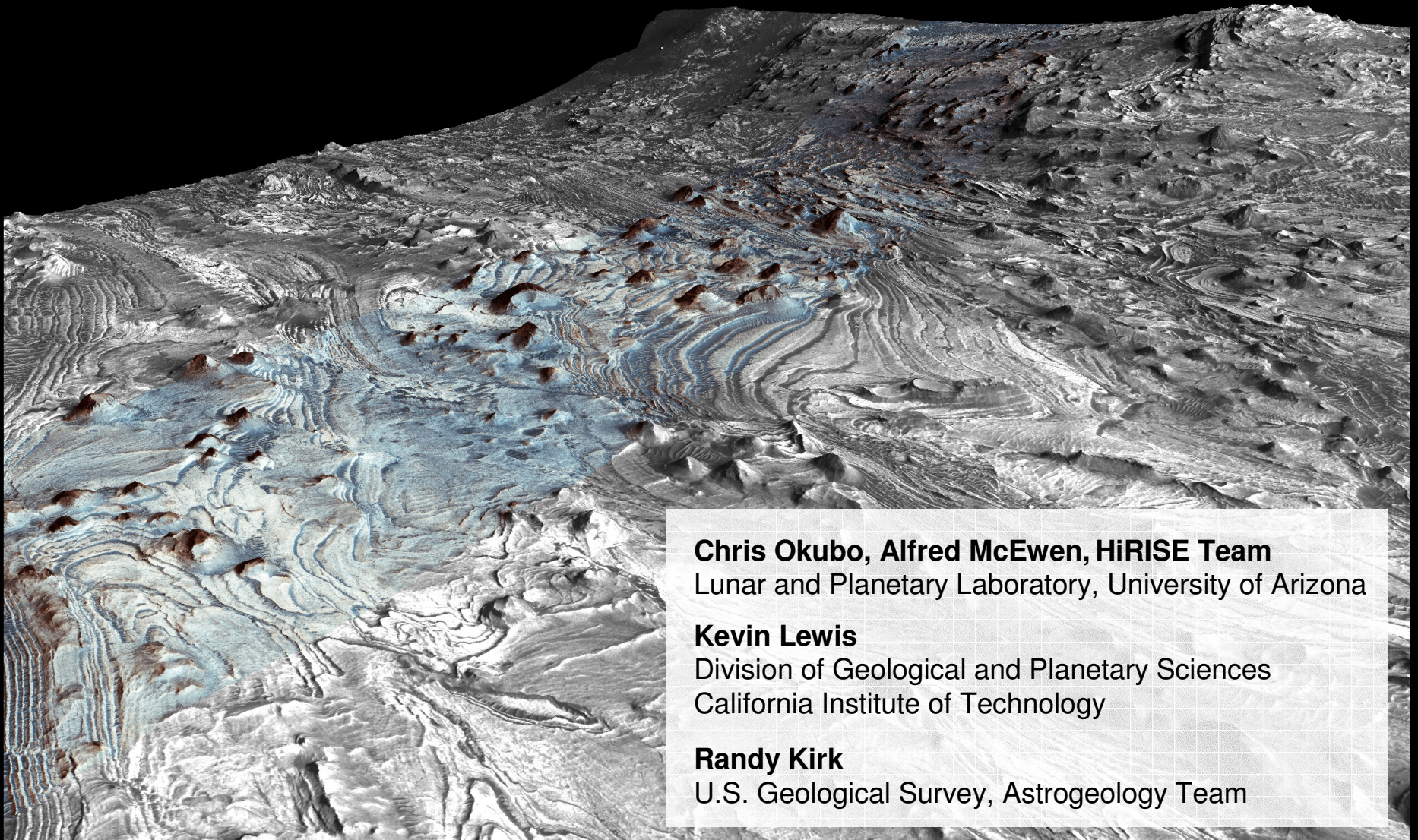


# High-resolution structural mapping in Southwest Candor Chasma

**HiRISE**  
HIGH RESOLUTION IMAGING  
SCIENCE EXPERIMENT  
[hirse.lpl.arizona.edu](http://hirse.lpl.arizona.edu)

THE UNIVERSITY OF ARIZONA  
Lunar and Planetary Laboratory



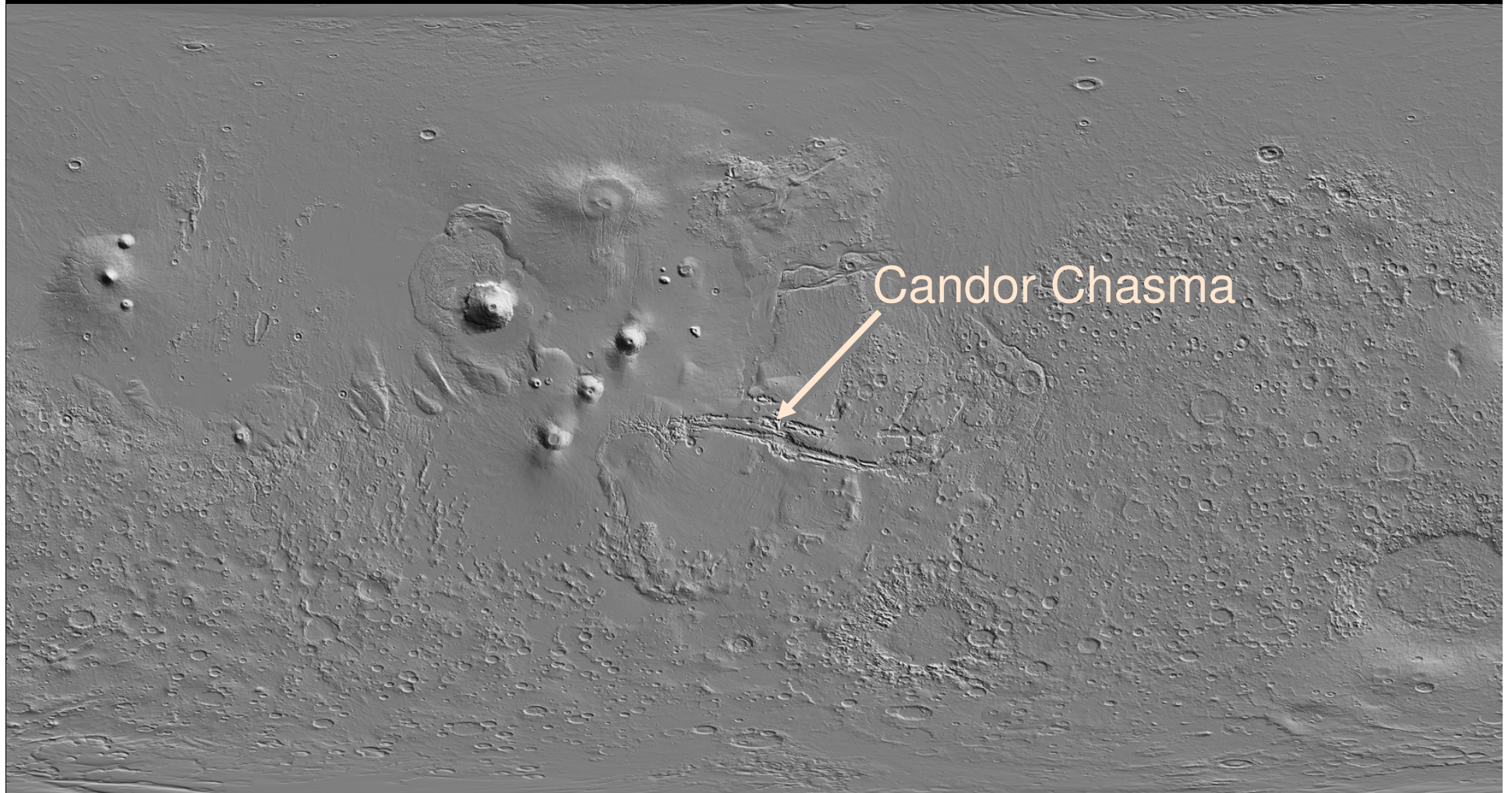
**Chris Okubo, Alfred McEwen, HiRISE Team**  
Lunar and Planetary Laboratory, University of Arizona

**Kevin Lewis**  
Division of Geological and Planetary Sciences  
California Institute of Technology

**Randy Kirk**  
U.S. Geological Survey, Astrogeology Team

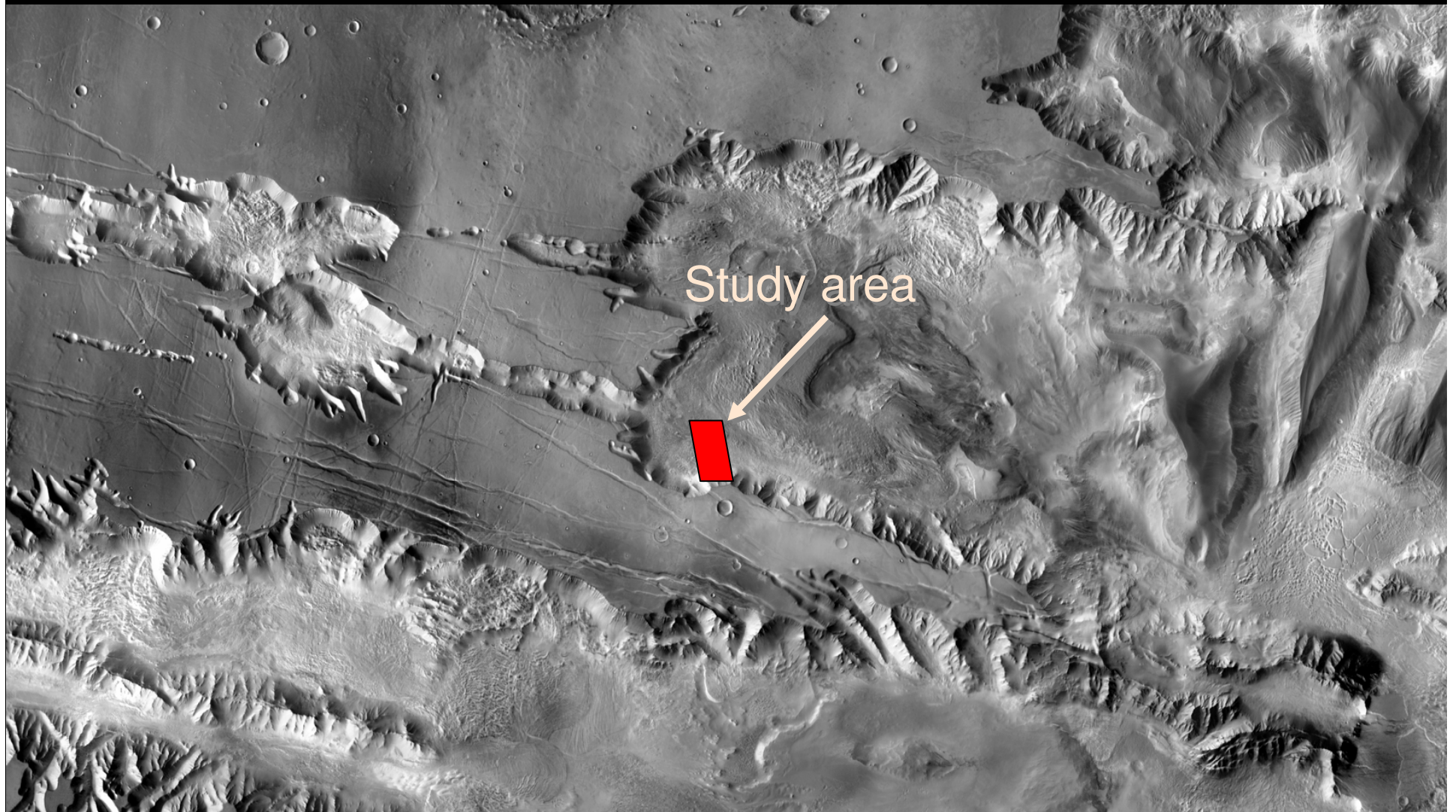


# Southwest Candor Chasma, Valles Marineris

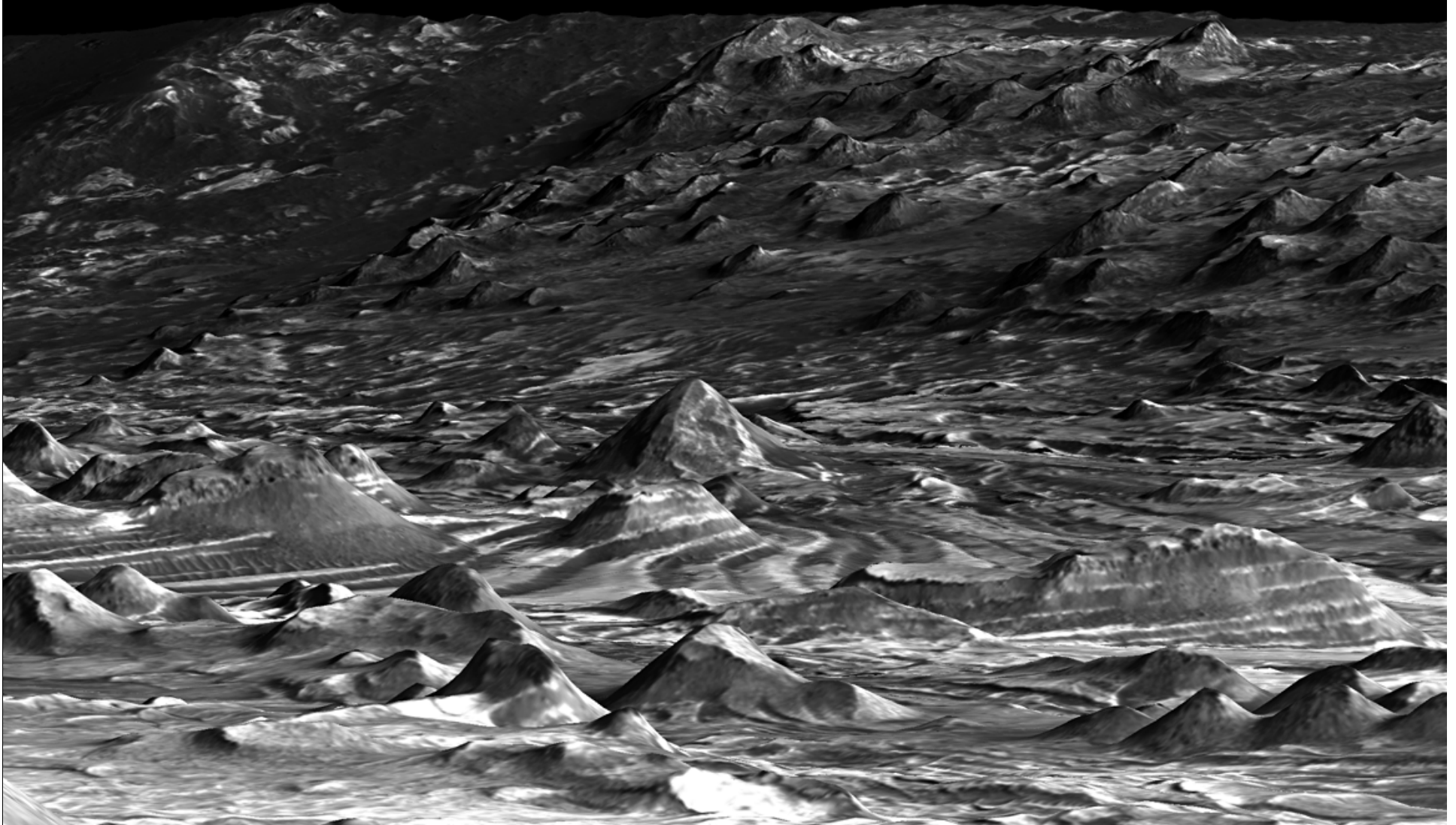




Layers contain abundant evidence of past groundwater

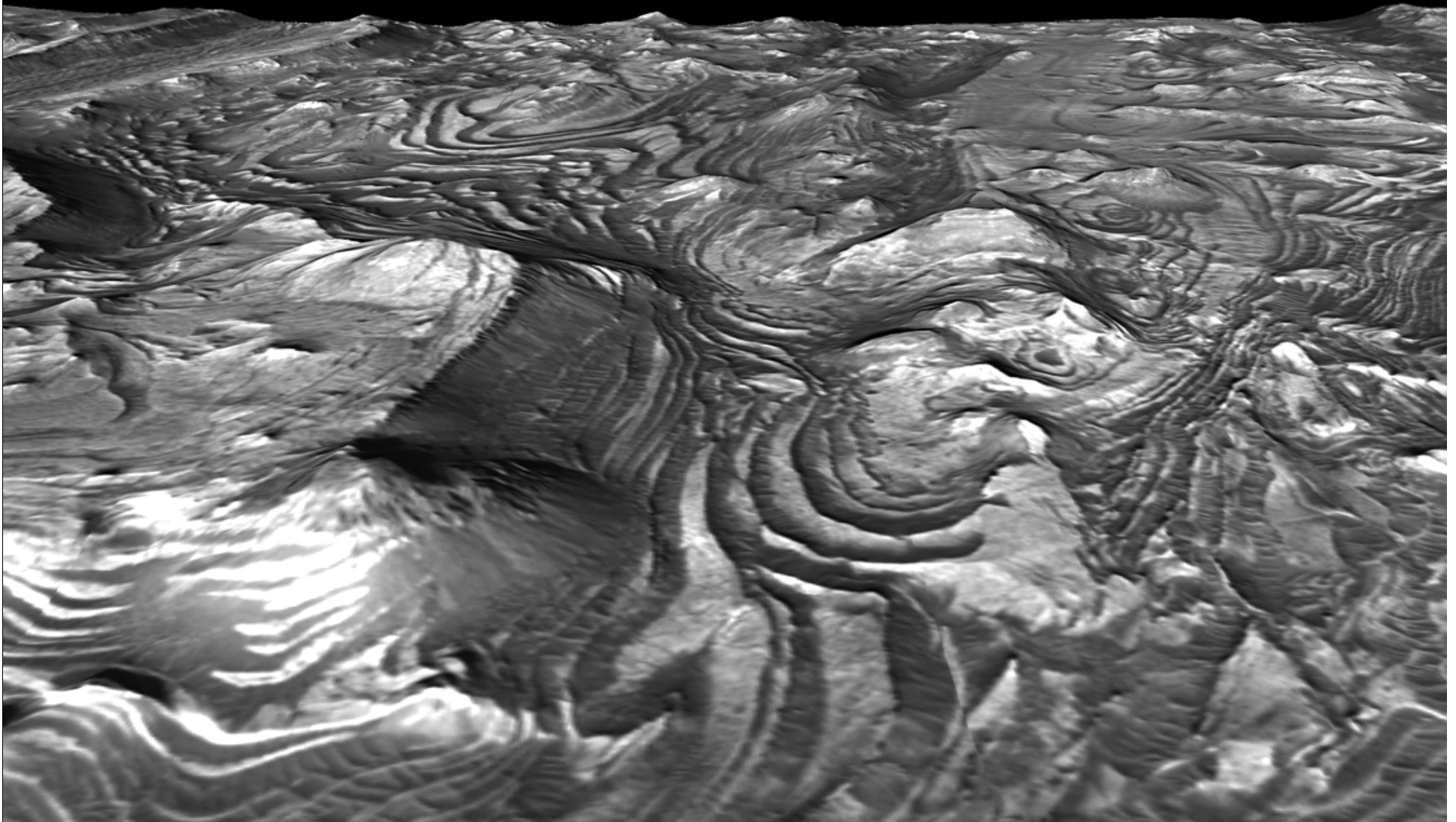


# Ground level view



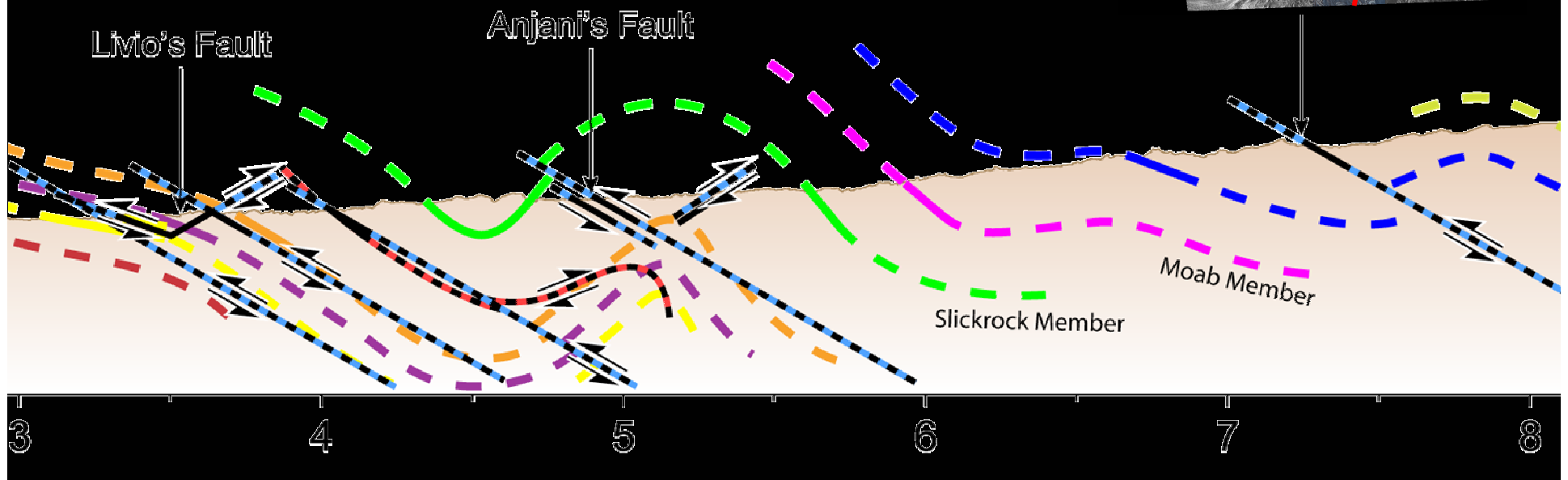
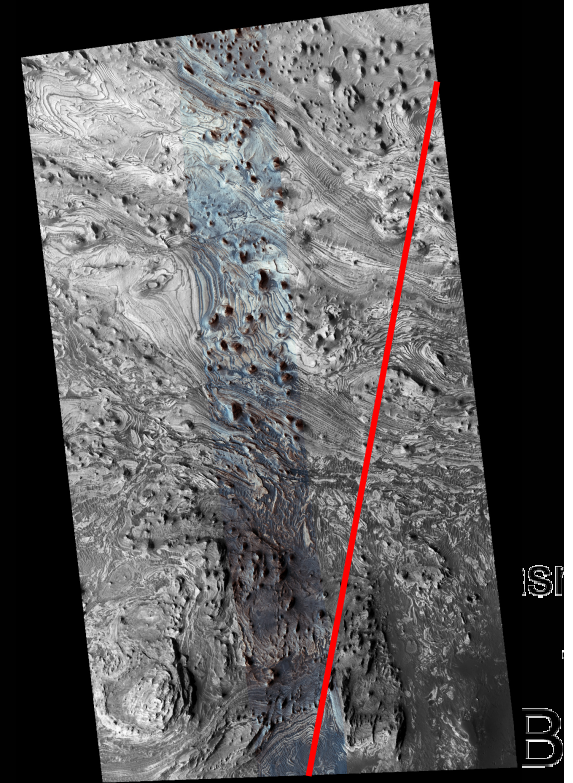


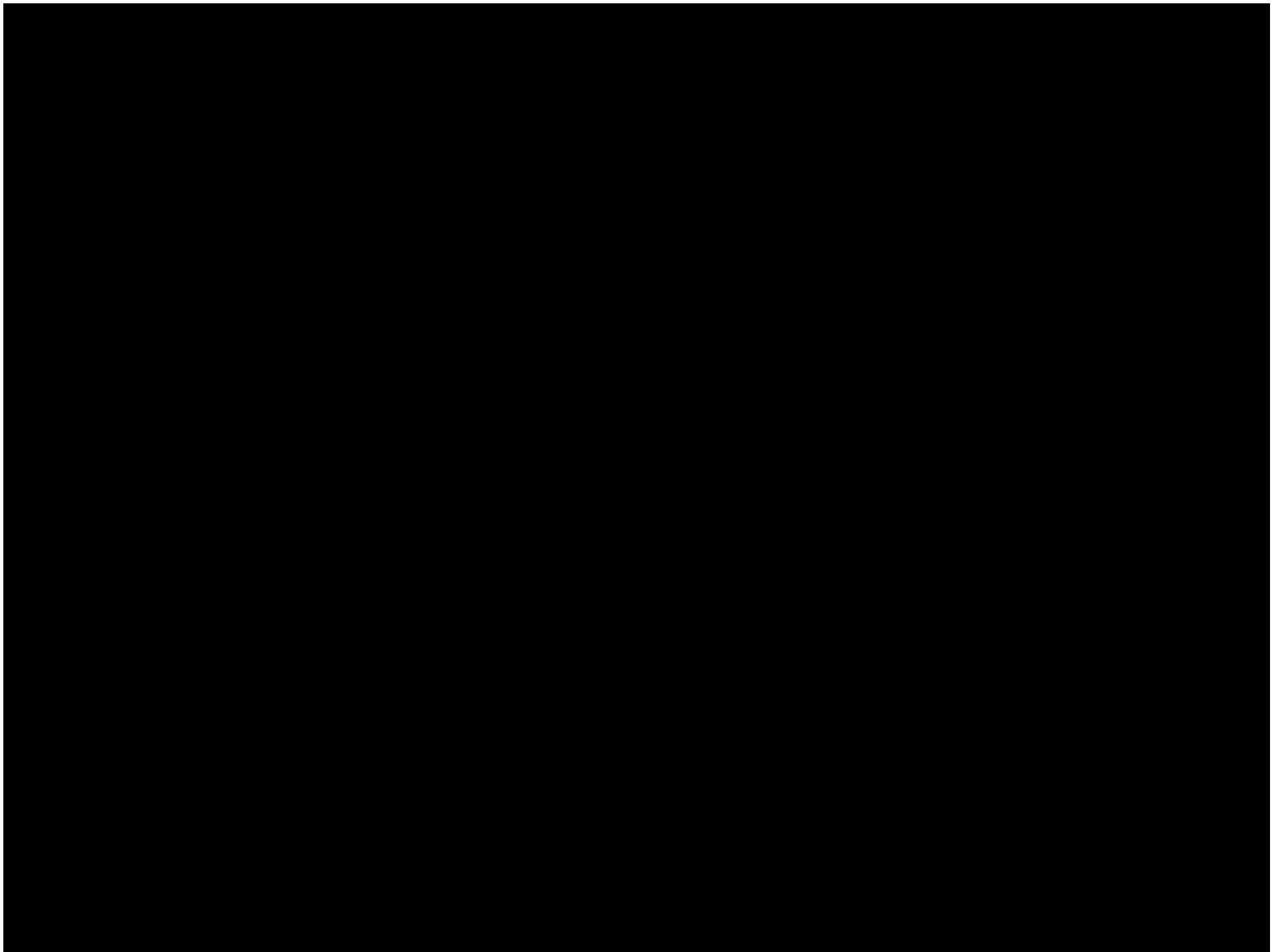
Low altitude view



# History recorded in the rocks

- Candor Chasma was a sedimentary basin
  - Paradox basin, SE Utah analog
- Preserves geologic history since 3.7 Gya
  - Chemistry may record global climate change
  - Transition to acidic groundwater
  - Iron cycling in acidic environment





# High-resolution topography

- Uses two HiRISE images of the same target
  - Same target
  - Different look directions
  - Parallax yields topography
- Each image
  - 27 cm per pixel sampling of surface brightness
  - Detect features ~27 cm across
  - Resolve 2D shape of features ~1 m across
- Both images combined
  - 1 m per pixel sampling of topography
  - Detect changes in elevation ~1 m across
  - Resolve 3D shape of features 3-5 m across
- Unprecedented resolution of geomorphology from orbit

